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Weather

WEATHER SUPPORT INSTRUCTION



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This instruction implements Air Force Policy Directive (AFPD) 15-1, *Atmospheric and Space Environmental Support*, Air Force Strategic Plan on Weather Reengineering (8 Aug 97); AFI 10-229, *Responding to Severe Weather Events*; AFI 15-114, *Functional Resource Weather Technical Performance Evaluation*, AFI 15-128 *Aerospace Weather Operations - Roles and Responsibilities*; Air Force Manual 15-111, *Surface Weather Observations*; AFMAN 15-124, *Meteorological Codes*; AFMAN 15-129, *Aerospace Weather Operations Processes and Procedures*; and AFMAN 15-135, *Combat Weather Team Operations*. It establishes responsibilities and weather support procedures pertaining to the 60th Air Mobility Wing (60 AMW) and host units at Travis AFB. It provides general information for weather services, including weather observations and forecasts; weather warnings, watches, and advisories; space weather supported services and dissemination of information, and reciprocal support. This instruction applies to all units assigned to the 60 AMW and hosted units at Travis AFB.

SUMMARY OF REVISIONS

This revision incorporates minor changes from AFIs and AFMANs listed in **Attachment 1**. These changes include, but are not limited to; omitting Viper Ops support, changes in warning and watch program, information on flight-managed missions. **A bar (|) indicates revision from the previous edition.**

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1. General.

1.1. **Contacting the Weather Flight (WF):** Weather personnel can be reached 24 hours a day, seven days a week.

1.2. **Concept of Operations (OWS-WF Team).** In conjunction with the Air Force Strategic Plan on Weather Reengineering (8 Aug 97) and AFI 15-128, *Aerospace Weather Operations Roles and Responsibilities*, the World map has been divided into ten Areas of Responsibility (AOR) with a designated “hub” or “OWS” supporting each region. The 25 OWS located at Davis-Monthan AFB, has been designated as the Weather Hub for Travis AFB. The 25 OWS AOR includes the western United States, South America, Mexico, Gulf of Mexico and Caribbean Basin (for a map with details see [Attachment 7](#)). The 25 OWS – 60 OSS/OSW team provides the local forecast, forecasted and observed weather warnings, watches, and advisories as well as transient briefing support for Travis AFB. The terms Weather Flight (WF) and Combat Weather Team (CWT) can be used interchangeably and in this instruction they both refer to the 60th Operations Support Squadron, Weather Flight (60 OSS/OSW).

1.3. **25 OWS Roles and Responsibilities.** To provide operational-level aerospace weather support to operational units assigned within and/or deployed into its AOR. The 25 OWS conducts a Meteorological Watch (METWATCH) within its AOR and amends for specified amendment criteria when they are met. 25 OWS products are available on their website: <https://25ows.dm.af.mil/> and include the Terminal Aerodrome Forecast (TAF), forecasted weather watches, warnings and advisories, and off-station support and transient flight weather briefings. This suite of products is transmitted from the 25 OWS over the New Tactical Forecast System (NTFS), after collaboration with 60 OSS/OSW.

1.3.1. **25 OWS DUTY PRIORITIES:** In the event of task saturation, the 25 OWS prioritizes support tasks in accordance with [Table 1](#).

Table 1. 25 OWS Duty Priorities.

Priority	Duties
1.	Perform Emergency War Order Taskings
2.	Respond to Aircraft/Ground Emergencies
3.	Provide Products and Services in Support of Combat, Contingency, & Military Operations Other Than War
4.	Provide Airborne Aircrew Support (Phone Patch)
5.	Provide Resource Protection (Forecast Weather Watches, Warnings and Advisories)
6.	Disseminate UUA Pilot Reports
7.	Prepare and Disseminate TAFs
8.	Provide Scheduled Flight Weather MEFs and Tactical-level, Non-Contingency MEFs (175-1, Flimsies, etc.)
9.	Prepare and Disseminate Peacetime/Exercise Regional and Operational-level Graphics
10.	Prepare and Disseminate Peacetime/Exercise and Operational-level Discussion Products (Regional Bulletins)
11.	Prepare and disseminate MOAFs and RCFs
12.	Provide Aerospace Weather Products, Information and Weather Briefings (Climatology, Plain Language Requests)
13.	Accomplish Other Routine Weather Support

1.4. **60 OSS/OSW Roles and Responsibilities.** The 60 OSS/OSW provides weather support to the 60 Air Mobility Wing (60 AMW), 349 AMW and hosted units assigned to Travis AFB, CA. Weather support includes, weather observing and MISSIONWATCH forecasting, aircrew and staff briefings, exercise/contingency support, Instrument Refresher Course (IRC) briefings and resource protection services for Travis AFB. Weather products are tailored to meet the criteria important to both flying operations (e.g., airborne aircraft, Control Tower, etc.) and base support agencies (e.g., Civil Engineering, aircraft maintenance, etc.). Forecasting and observing services are provided 24 hours a day, seven days a week. All supported units should coordinate with the 60 OSS/OSW to change this instruction or request special support not specified within this instruction.

1.4.1. 60 OSS/OSW Duty Priorities. Forecasting services cannot always be provided on a first-come, first-served basis. We may be unable to quickly handle every request for weather service during adverse weather or heavy workloads. Certain duties we perform have a greater urgency than others. AFMAN 15-129, *Aerospace Weather Operations-Processes and Procedures*, requires the 60 OSS/OSW to establish a duty priority list, see [Table 2.](#) Our list ensures tasks are performed according to their relative importance.

Table 2. 60 OSS/OSW Duty Priorities.

Priority	Duties
1.	Perform Emergency War Order Taskings
2.	Respond to Aircraft/Ground Emergencies.
3.	Take and disseminate surface weather observations <i>locally</i> .
4.	Answer Pilot-to-Metro-Service (PMSV) calls.
5.	Issue observed weather warnings or advisories.
6.	Collaborate with OWS on weather warnings, advisories, and watches. Disseminate if necessary.
7.	Disseminate pilot reports (PIREPs) locally.
8.	Transmit surface observations and PIREPs longline.
9.	Provide mission execution forecasts.
10.	Collaborate with OWS on installation forecast.
11.	Provide other briefings.
12.	Conduct mission essential training.
13.	Administrative duties and base details.

NOTE: Local dissemination refers to weather information that is sent to *base* agencies on the New Tactical Forecast System (NTFS) or voice relay (see [Attachment 2](#) and [Attachment 3](#)).

1.5. Operational Support Requirements:

1.5.1. Supported agencies will:

1.5.1.1. Establish and coordinate all weather support requirements and procedures with 60 OSS/OSW.

1.5.1.2. Notify 60 OSS/OSW 72 hours in advance of any known mass briefing to support mission requirements.

1.5.1.3. Notify 60 OSS/OSW of any additions or changes to weather support requirements. This should be done with sufficient advance notice (normally 10 working days) to preclude adverse impact on WF operations.

1.5.1.4. Utilize NTFS terminals/TAFB Weather Homepage to the greatest extent possible as the first source of weather data. Data provided for Travis AFB includes current observations, 24-hour forecasts, 12-hour flight planning forecasts, weather warnings, watches, and advisories. Weather personnel will normally refer callers for this data to their NTFS terminal unless the caller has no terminal or their terminal is inoperative. Agencies without an NTFS terminal, who have a valid and regular need for weather data, use the following links:

http://132.33.152.122:82/pv/local_top.htm Local Weather Sheet.

[\\isxdmtweb1\60oss\Weather\index.html](http://isxdmtweb1\60oss\Weather\index.html) Travis AFB Weather Homepage.

1.5.1.5. Contact the 60 OSS/OSW for Climatological Data regarding Travis AFB, as well as

other locations.

1.5.2. Unit commanders will:

1.5.2.1. Ensure they are kept informed of critical weather elements affecting their operations.

1.5.2.2. This is accomplished by dissemination of weather information through established communication procedures as outlined in Chapter 5 and [Attachment 4](#) in this instruction.

1.5.2.3. Ensure procedures are established within their organization to adequately respond to disseminated weather information.

1.5.2.4. Review this instruction at least annually for any changes in support requirements. Coordinate these changes with 60 OSS/OSW.

1.6. Alternate Weather Operations Site (AWOS): If an evacuation of the primary observation/forecast site (Building 4) becomes necessary, an alternate weather operations site has been established. The alternate site is in Building 556, Room 2, 60 OSS/OSF (Combat Crew Training School, CCTS). Minimum requirements for the alternate site are availability of power, a Class A telephone jack with same capabilities as WF line, easy access to the outside of the building, a view of the flight line area, a Pilot-to-Metro-Service (PMSV) drop and one Local Area Network (LAN) drop. The alternate site will then become the official point of observation (location marked with a circle with an X through it).

1.6.1. Limitations at AWOS:

1.6.1.1. Visual obstructions to view include, but are not limited to, trees, buildings, and a hangar.

1.6.1.2. If the fixed airfield meteorological observation equipment is down, then some equipment used at the AWOS is considered tactical and elements of our recorded observations may become estimated at the AWOS.

1.6.1.3. If evacuation to the AWOS becomes necessary, the MEF products will be degraded due to equipment limitations.

1.7. Public Release of Weather Information: All weather information produced by the 60 OSS/OSW is "For Official Use Only". 60 OSS/OSW will forward all requests for weather information from non-DOD/public agencies to the 60 AMW Public Affairs (PA) office. 60 OSS/OSW will not provide Travis AFB historical or real-time weather data to non-governmental agencies without approval from 60 AMW/PA.

2. Weather Observing.

2.1. General: Weather personnel take official weather observations hourly (24 hours a day, seven days a week) and when specific regulatory and locally established thresholds are met. The official weather observation point on Travis AFB is on the roof of Building 4, Base Operations.

2.2. Terms Explained:

2.2.1. Basic Weather Watch (BWW). Weather personnel who, because of other duties, may not be able to monitor the weather continuously normally conduct a BWW from the WF. Because of this, weather personnel cannot be expected to detect and report all weather changes as they occur. The BWW program involves detecting the special criteria in [Table 3](#).

2.2.2. Cooperative Weather Watch (CWW). CWW is a program wherein qualified non-weather personnel assist the weather personnel in monitoring the weather conditions for the occurrence of previously unreported weather conditions which could affect flight safety or which could be critical to the safety or efficiency of other local operations and resources. At Travis AFB a CWW is in effect between the WF and the Control Tower.

2.2.3. Hourly Observations (METAR). Hourly observations are complete weather observations reported at approximately 55-59 minutes after each hour. The specific contents of hourly observations are listed in [Attachment 2](#).

2.2.4. Special Observations (SPECI). Special observations are taken to report significant changes in weather elements at units that are required and scheduled to transmit surface observations on longline circuits. [Table 3](#). shows special observation criteria for Travis AFB.

2.2.5. Local Observations. Local observations are taken primarily to report changes in conditions significant to local airfield operations but do not meet special criteria. [Table 4](#). lists local observation criteria for Travis AFB.

2.2.6. Prevailing Visibility. The greatest visibility equaled or exceeded throughout at least one-half the horizon circle. The visibility does not have to be continuous throughout 180 consecutive degrees (i.e., it may be composed of sectors distributed anywhere around the horizon circle).

2.2.7. Sector Visibility. The visibility in a specified direction representing a 45-degree arc of the horizon circle.

2.2.8. Surface Visibility. The prevailing visibility determined from the usual point of observation. It normally represents a value observed at a height of six feet.

2.2.9. Tower Visibility. The prevailing visibility determined from the Control Tower when the surface visibility is determined from another location such as the weather station.

2.2.10. Runway Visual Range (RVR). The maximum distance in the direction of takeoff or landing at which the runway, or specified lights or markers delineating it, can be seen from a position above a specified point on its center line at a height corresponding to the average eye level of pilots at touch-down.

2.3. Observing Limitations: Weather personnel cannot detect and report every weather change as it occurs. Changes that occur while weather personnel are disseminating information may go unreported until the next opportunity to observe. A cooperative weather watch, in which the Control Tower air traffic controllers are trained to assist in observing as a secondary function, reduces the impact of this limitation.

2.4. Special and Local Observation Criteria:

2.4.1. Travis AFB weather personnel function under the BWW and CWW concept. Due to other essential duties, weather personnel cannot monitor the weather on a continuous basis. Weather personnel check conditions at least every 20 minutes and take observations as warranted using criteria outlined in [Table 3](#). and [Table 4](#).

Table 3. Special Observation Criteria.

Phenomena:	Does the Following:
1. Ceiling	Forms or dissipates below, decreases to less than or, if below, increases to equal or exceed (in feet above ground): 3000, 1500, 1000, 800, 700, 600, 500, 400, and 200.
2. Prevailing Visibility	Decreases to less than or, if below, increases to equal or exceed (in statute miles, SM): 3, 2 $\frac{3}{4}$, 2 $\frac{1}{2}$, 2 $\frac{1}{4}$, 2, 1 $\frac{3}{4}$, 1 $\frac{1}{2}$, 1 $\frac{1}{4}$, 1, $\frac{3}{4}$, $\frac{1}{2}$, 1/16.
3. A layer of clouds or obscuring phenomena aloft	Is observed below 800 feet and no layer aloft was reported below this height in the previous METAR, Record Special, or Special observation
4. Tornado or Funnel Cloud	Is observed or disappears from sight.
5. Thunderstorm	1. Begins (When thunder is first heard or when hail is falling or lightning is observed in the immediate vicinity of the airfield and the noise level is such that the resulting thunder cannot be heard. Not required to report the beginning of a new thunderstorm if one is currently being reported). 2. Ends (15 minutes after last occurrence of criteria for a thunderstorm).
6. Precipitation	1. Rain begins or ends. 2. Hail begins or ends. 3. Freezing precipitation begins, ends, or changes intensity. 4. Any other type of precipitation begins or ends.
7. Wind Squall	Wind speed increases at least 16 knots, and is sustained at 22 knots or more for at least a minute. A SPECI is not required to report a squall if one is currently in progress.
8. Wind Shift	The wind direction changes by 45 degrees or more in less than 15 minutes with sustained winds (or gust) of 10 knots, or more, throughout the wind shift.
9. Runway Conditions	Upon receipt, transmit runway condition readings (RCR) as a SPECI or append to a METAR or SPECI being taken at the time of notification. (This non-weather criterion is treated as a "SPECI" only for purposes of timely longline reporting.)
10. Tower Visibility	When Tower visibility or Weather's visibility is less than 4 statute miles and they differ by a reportable SPECI criteria value, transmit a SPECI with Tower visibility as a remark.
11. Volcanic Ash	When first observed.
12. Real-World Nuclear Accident	When notified of a real-world nuclear accident.
13. Resumption of observing services	Upon returning to duty following a break in hourly coverage if a METAR was not filed as scheduled during that 15-minute period.

14. Miscellaneous	Any other meteorological situation, which, in the opinion of the weather person, is critical to the safety of aircraft operation.
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Table 4. Local Observation Criteria.

1. Aircraft Mishap	Immediately following notification or sighting of an aircraft mishap at or near Travis unless there has been an intervening METAR or SPECI.
2. Altimeter Setting	Reported at a frequency not to exceed 35 minutes when there has been a change of 0.01 inch Mercury or more since the last locally disseminated value.
3. Runway Change	Upon notification by Tower of a runway change.
4. Runway Visual Range (RVR)	<p>1. Visibility first drops to one mile or less, or when visibility increases to above one mile.</p> <p>2. RVR for the active runway decreases to less than, or if below, increases to equal or exceed: 6000 feet, 5000 feet, 4000 feet, 2400 feet, 1800 feet, 1600 feet, and 1200 feet.</p> <p>3. RVR is first determined to be unavailable (RVRNO) for the runway in use, and when it is first determined that the RVRNO report is no longer applicable, provided conditions for reporting RVR still exist.</p>
5. Air Force One	Taken 10 minutes prior to the arrival or departure of Air Force One.
6. Miscellaneous	Any other meteorological situation which, in the opinion of weather personnel, is significant to local operations.

2.4.2. The following limitations may impact the accuracy of Travis AFB weather observations.

2.4.2.1. Buildings, hangars, parked aircraft, light towers, and trees block portions of the sky as well as ground visibility reference markers, especially to the north (350°-020°) and south-southwest (200°-230°).

2.4.2.2. Light contamination can obscure sky conditions and visibility when observing at night.

2.4.2.3. Aircraft engine noise can prevent weather personnel from hearing thunder.

2.5. Meteorological Equipment Locations and Limitations: [Attachment 5](#) shows the runway complex and the location of weather sensors. Readouts for all meteorological sensors are located in the WF in building 4. The primary runway is 21L/03R, a dual-instrumented, Category II Instrument Landing System (ILS) runway. The secondary runway, 21R/03L, is parallel to the primary runway and begins where the primary ends. West of runway 03L is the Aero Club runway, a small paved strip with no nav aids or weather sensors. The primary observing equipment includes the following:

2.5.1. Laser Cloud Height Detection System (GMQ-34). The GMQ-34 accurately measures cloud bases up to 12,000 feet. The two CT-12K, Laser Beam Ceilometers (LBC) are located at the far northeast and southwest ends of the runway complex near the approach ends of runways 21L and 03L. To measure a cloud base, the cloud must be directly over the projector. Weather personnel

verify all sensor readings to determine whether a true ceiling exists or if a small patch of clouds just happens to be over the sensor's beam.

2.5.2. Surface Wind Measuring Set (FMQ-13). This system provides a two-minute average of wind direction and speed updated every five seconds. The three sensors are located near the touch-down ends of runways 21L, 03R, and 03L. The sensor next to 03R is close enough to be considered representative of runway 21R. Wind speed and direction readouts are located at the WF, Control Tower, and RAPCON. Headquarters USAF/XOW requires all wind readings from the FMQ-13 to be recorded as estimated until the system is replaced. **As of 1 May 2003 we are expecting the OS-21 (FMQ-19) install to take place in the Fall of 2003.**

2.5.3. Transmissometer (GMQ-32). The GMQ-32 employs a light projector and a receiver to determine the Runway Visual Range (RVR). There are four GMQ-32 sensors located near the touchdown and rollout ends of both runways. RVR displays (RVR-400) are located in the WF (for touchdown and rollout), in the IFR room at the RAPCON, and in the Control Tower. **NOTE:** In order to have an accredited Category II instrument landing system, FAA standards require that digital readouts to touchdown and rollout RVR must be available/operational in the Air Traffic Control Tower. The WF will only report touchdown RVR Temperature/Dew Point System (FMQ-8). The FMQ-8 provides a continuous, automatic, and unattended measurement and display of ambient air temperature and dew point. There is one sensor and it is located approximately 3,000 feet from the touchdown end of runway 21R and 650 feet to the left of the centerline. The backup for this sensor is a TH550 hand-held thermometer.

2.5.4. WSR-88D, Doppler Weather Radar. The display unit for the weather radar or Principal User Processor (PUP) is located in the WF, while the radar itself is located near Davis, approximately 19 miles to our northeast. We are expecting to lose this capability at the end of fiscal year 2003. This is an Air Force wide change, where this system will only be left at bases that experience severe weather. We will then rely on the Internet for radar capabilities. Limitations of the WSR-88D include:

2.5.4.1. Echoes below approximately 1,500 feet are not detectable in the local Travis AFB airspace.

2.5.4.2. Inability to detect lightning strikes.

2.5.4.3. Range of 248 nautical miles (NM) for most radar products, and an effective range of about 60 NM for detection of severe weather.

2.5.4.4. There is currently no suitable operational backup for the WSR-88D.

2.5.5. Wind Profiler. A Radian Technologies wind profiler is located in Building 0112-0212, approximately one mile to the north-northeast of the WF. Using Doppler Radar, it provides upper level wind data directly over Travis AFB and is valuable in helping to detect low-level wind shear. Data is displayed approximately every 200 feet up to approximately 5,000 feet above ground level. Limitations: The profiler does not provide very reliable data during rain.

2.5.6. Pressure. An ML-658 Digital Barometer Altimeter Setting Indicator (DBASI) is located in the WF. The DBASI continuously provides station pressure and altimeter setting in millibars (MB) or inches of mercury (Hg).

2.5.7. Rain Gauge. The ML-17 rain gauge is located on the roof of the weather station.

2.5.8. Stormscope Lightning Detector. The Stormscope is a lightning detector at Travis AFB. It is a small, tactical system, and the information is considered more reliable with stronger storms.

3. Weather Forecasting.

3.1. **General:** The 25 OWS along with Travis AFB weather personnel provide round-the-clock forecasting (24 hours a day, seven days a week) services for Travis AFB, 60 AMW, 349 AMW, and hosted units outlined herein. Forecast products include, but are not limited to, 24-hour TAF, weather warnings, watches, advisories, and flight weather briefings.

3.2. **Limitations:** Geographic influences near Travis AFB contribute to sudden wind changes and can prevent accurate analysis of the wind field in the Travis AFB area. Experience shows that forecast accuracy decreases as the length of the forecast term increases. Therefore, short-term operational forecasts are generally more accurate than 24-hour forecasts, which, in turn, are generally more accurate than outlooks beyond 24 hours. In the event of a data cut off (communication outage, evacuation, etc.), forecasting skill degrades as weather information available to forecasters decreases.

3.3. Terms Explained:

3.3.1. Combat Weather Team (CWT). A generic term used to describe a weather team that provides mission-tailored weather products and services to a supported unit either in garrison, or at a deployed location. CWTs are normally organized as WF under OSS for USAF operations.

3.3.2. MISSIONWATCH. The monitoring of aerospace weather for a specific mission (i.e., ground, air, or space) and informing supported agencies when unforecasted mission-limiting phenomena could effect operations.

3.3.3. Off-Station Briefing. Weather briefing, provided by the 25 OWS, given to aircrews not assigned to Travis AFB.

3.3.4. On-Station Briefing. Weather briefing given to aircrews assigned to Travis AFB.

3.3.5. Terminal Aerodrome Forecast (TAF). The TAF is the official forecast for the airfield (5 Statute Miles (SM) radius) covering a 24-hour period, issued every eight hours by the 25 OWS.

3.3.5.1. Thunderstorm (TS). A convective storm which implies the presence of lightning, hail, gusty winds, low-level wind shear, heavy precipitation, icing, and turbulence.

3.3.6. Weather Radar. Radar data is received from a 10-centimeter wavelength WSR-88D (Weather Surveillance Radar – 1988 Doppler), and displayed on the Doppler Weather Radar PUP. It can detect and display precipitation areas located within 248 NM of the antenna located at Davis, 19 miles northeast of Travis AFB.

3.3.7. Weather Satellite Imagery. The WF uses NTFS and the Internet to retrieve and display visual, infrared, and water vapor satellite imagery.

3.3.8. Operational Weather Squadron (OWS). An organization comprised of management, technician, and training personnel responsible for providing regional weather support. Their mission is to provide synoptic/mesoscale weather forecast products and services to customers within their area of responsibility.

3.3.9. Meteorological Watch (METWATCH). The process of monitoring observed and forecast weather and informing supported agencies when certain established weather conditions that could affect their operations or pose a hazard to life or property are occurring or are expected to occur.

3.3.10. Universal Time. Worldwide standard time reference, also known as ZULU (Z) time. At Travis AFB, Z time is Local Standard Time plus eight hours (during Daylight Savings Time, plus seven hours).

3.4. Terminal Aerodrome Forecast (TAF): Used by Air Force weather personnel to encode forecasts. See [Attachment 2](#) for an example of an encoded TAF. Unless otherwise specified, the forecast weather elements in the main body of the forecast text (clouds, weather, wind, etc.) apply to the area within a five statute mile radius of the Travis AFB runway complex. Forecast elements represent the most probable conditions expected during the forecast period.

3.4.1. When certain weather thresholds are expected to occur, the change will be reflected in the TAF, to include the expected time of occurrence, duration and intensity. These *specification criteria* are listed in [Table 5.](#) The TAF code shows forecast changes in the weather using the following groups:

3.4.1.1. BECMG (becoming) indicates that the change is expected to occur at a fairly constant rate and be complete by the end of the noted time period. BECMG groups will normally be one hour and will never be more than two hours. EXAMPLE: BECMG 1213 indicates a change expected between 1200 Z and 1300 Z.

3.4.1.2. FM (from) shows that the change is expected to take place quickly at a specific time.

3.4.1.3. TEMPO (temporary) shows that the change is expected to occur frequently but briefly between two points in time. TEMPO is used when conditions are expected to occur for less than one hour at a time (1 hour 15 minutes for thunderstorms, the extra 15-minute period between the time thunder is last heard and the thunderstorm is officially ended).

3.4.2. TAF Issue Times. TAFs are issued three times daily at the following times: **0400 Z** (2000 PST/2100 PDT), **1200 Z** (0400 PST/0500 PDT), and **2000 Z** (1200 PST/1300 PDT).

3.4.3. TAF Amendments. 25 OWS and Travis AFB weather personnel will ensure the TAF is representative of expected or actual conditions and will amend the TAF for the criteria listed in [Table 6.](#)

3.4.3.1. 25 OWS forecasters may amend the TAF anytime they consider it advisable in the interest of safety, efficiency of aircraft operations, flight planning, operational control, or to assist in-flight aircraft.

3.4.3.2. 25 OWS forecasters will amend the TAF anytime an unforecasted change is expected to occur, or occurs, and is expected to last more than 30 minutes and is not correctly forecast by the next whole hour. An amendment is also required when a forecast condition does not occur by the specified hour and is not expected to occur within the next 30 minutes.

3.4.3.3. Temporary groups will be amended when they become predominant and are not expected to return to temporary, or do not occur and are not expected to occur.

Table 5. TAF Specification Criteria.

1. Ceiling or visibility increases to equal or exceed, or decreases to less than:	
<u>Ceiling:</u>	<u>Visibility:</u>
3,000 feet	3 miles
1,500 feet	2 miles
1,000 feet	½ mile
200 feet	
2. Wind.	
2.1. Speed changes of 10 knots or more, including gusts.	
2.2. Direction change of 30 degrees or more when the predominant wind speed or gusts are expected to be in excess of 15 knots.	
3. Precipitation.	
4. Thunderstorms.	
5. Turbulence and/or icing conditions not associated with thunderstorms, from the surface to 10,000 feet above Mean Sea Level (MSL) for moderate or severe thresholds for CAT II aircraft.	
6. Non-Convective Low Level Wind Shear.	
7. Weather warning/watch/advisory criteria that can be specified in the TAF.	
8. Other. Any other meteorological condition which, in the opinion of the forecaster, is essential to adequately describe the weather.	

Table 6. TAF Amendment Criteria.

1. Ceilings or visibilities are observed or later forecast to increase to or exceed, or decrease to less than any of the following values:

<u>Ceiling:</u>	<u>Visibility:</u>
3,000 feet	3 miles
1,000 feet	2 miles
200 feet	½ mile

2. **Wind.**

- 2.1. An error in forecast winds of 10 knots or more (including gusts).
- 2.2. An error in forecast winds of 30 degrees or more when the predominant wind speed (including gusts) is, or is forecast to be, in excess of 15 knots. Also refer to 7c.

3. **Precipitation.**

- 3.1. Unforecasted freezing precipitation begins or ends.
- 3.2. The beginning or ending of precipitation causes a weather warning or advisory to be issued, canceled, or amended.
- 3.3. The forecaster considers the precipitation (or lack of) to be operationally significant.

4. **Thunderstorms** – See #7

5. Beginning or ending of **turbulence** and/or **icing** conditions, not associated with thunderstorms, from the surface to 10,000 feet MSL which first meet, exceed, or decrease below moderate or severe thresholds for CAT II aircraft and wasn't specified in the forecast.

6. Non-Convective **Low Level Wind Shear**:

- 6.1. Is occurring and is expected to continue, or is expected to begin, but is not specified in the forecast.
- 6.2. Is in the TAF, but is no longer expected to occur during the forecast period.

7. Any of the locally established criteria for **weather warnings and advisories** (Tables 4.2, and 4.3) or a lightning **watch** (Table 7.) which:

- 7.1. Occur or are expected to occur, during the forecast period but weren't correctly specified in the forecast.
- 7.2. Are no longer occurring or expected to occur.

8. **Other.** The forecaster considers the occurrence or non-occurrence of other elements not actually requiring an amendment to be operationally significant.

3.5. **Mission Execution Forecast (MEF) Products:** Travis AFB weather personnel use the MEF process to build MEF products.

3.5.1. During MISSIONWATCH, the 60 OSS/OSW may update some MEF products due to unforecasted severe weather conditions. If the aircraft is in the local flying area and can be reached via Pilot-to-Metro-Service (PMSV), that is how weather personnel will relay weather updates. If the aircraft is outside of our PMSV range, the 60 OSS/OSW will make every effort to contact the aircraft through Tanker Airlift Control Center (TACC), or other means.

3.5.2. The following are the MEF products:

3.5.2.1. DD Form 175-1, **Flight Weather Briefing**.

3.5.2.2. AMC Form 181-1, **AMC Mission Weather Briefing**.

3.5.2.3. Local Weather Sheet (LWS) - **Attachment 6** shows an example of our Local Weather Sheet, current TAF, climb data information, local hazards, sunrise and sunset data, as well as forecasts for local work areas. For details go to: http://132.33.152.122:82/pv/local_top.htm

3.5.2.4. Navy Package – includes hazards, flight level winds, freezing level, and ditch headings.

3.5.2.5. Travis AFB weather web page: Aircraft specific information. For details go to: <http://isxdmtweb1/60oss/Weather/index.html>

3.5.2.6. Staff Weather Briefings: May include, United States, Atlantic Ocean, Pacific Ocean, Indian Ocean satellite shots, five day outlook and alternate weather for AMC bases and others as requested by the Wing leadership.

3.6. **25 OWS Back-Up Support:** If the 25 OWS becomes unable to disseminate products (due to a communication outage), the 60 OSS/OSW will disseminate the products. Other outages will be handled on a case-by-case basis. For pertinent information see **Attachment 9**.

3.7. **Weather Briefings:** 60 OSS/OSW provides weather briefings to numerous customers on a scheduled basis. These briefings provide commanders, staff, operations, and aircrew personnel with weather information for planning and decision-making. Crisis Action Team (CAT), deployment, stand-up, planning, aircrew safety and climatological briefings are provided routinely upon request. New briefing requirements and/or format changes for existing briefings should be coordinated with 60 OSS/OSW 10 working days prior to implementation, as manning allows.

3.7.1. Flight Weather Briefings.

3.7.1.1. Flight weather briefings will be provided IAW AMCI 15-101 and AFMAN 15-125. 60 AMW and 349 AMW missions will be briefed in accordance with the Wing Operations Plan.

3.7.1.2. Written flight weather briefings will be prepared using DD Form 175-1, AMC Form 181, or computer generated forms.

3.7.1.3. Aircrews who receive a faxed weather briefing form must contact (by telephone or in person) the duty forecaster prior to take-off for the weather briefing to be considered official.

3.7.1.4. Required information for validity includes brief time, forecaster's initials, and (when applicable) appropriate void times.

3.7.1.5. Aircrews may receive verbal briefings upon request. Verbal weather briefings will be recorded on a Travis AFB Form 128, **Weather Local Briefing Sheet**.

3.7.1.6. The Tanker Airlift Control Center (TACC) issues flight weather briefings for various AMC missions. Aircrews that are on an M2K (Mobility 2000) or IFM (Integrated Flight Management) mission will receive a weather package along with a flight plan and other information from the TACC flight manager. 60 OSS/OSW has been directed by AMC to not make any changes or updates to these packages other than take-off weather out of Travis AFB. All other updates must be worked through the weather flight at TACC.

3.8. **Pilot-to-Metro-Service (PMSV):** 60 OSS/OSW operates a PMSV radio on Ultra High Frequency (UHF) 269.2 MHz. PMSV is the primary means of disseminating weather information to airborne aircraft. The control tower will be notified of any PMSV outages and the expected time of return to service. During such outages, control tower personnel will relay all Pilot Reports (PIREPs) to weather personnel, workload permitting. PMSV contacts will be recorded on a Travis AFB Form 145, **Pilot- to-Metro Contact Log Sheet**. There are no send/receive limitations known to date.

3.9. **Toxic Corridor Calculations:** Bio-Environmental Engineering and the Readiness Flight will calculate the toxic corridor. The WF will provide environmental data as requested.

3.10. **Space Weather Support and Service:** 60 OSS/OSW personnel will evaluate space weather products and brief aircrews if there is a forecasted space weather impact along their route. Supported units may also request space weather as needed. Examples of two available products are listed below.

3.10.1. Ionospheric Conditions for High Frequency (HF) Radio Wave Propagation Applications.

3.10.2. Ionospheric Conditions for Ultra High Frequency (UHF) SATCOM (245-410 MHz) Applications.

4. Weather Warnings, Watches, and Advisories.

4.1. **General:** Certain weather conditions endanger property or life, pose a safety hazard, or adversely effect a supported agency's operations. The 25 OWS and 60 OSS/OSW will monitor observations and forecasts for these conditions and advise support agencies when these conditions are observed or forecast. Weather warnings, watches, and advisories are the vehicles through which supported agencies are notified of these critical weather conditions.

4.2. **Limitations:** Due to the complexity of our communication systems and our dependence on the base Local Access Network (LAN), limitations exist.

4.2.1. During communication outages the 60 OSS/OSW will make back-up calls to base agencies according to the notification pyramid. (See [Attachment 4](#)) The 60 OSS/OSW will also make every effort to use other dissemination means (calling other bases, AOL account) to transmit observations, the TAF, and weather watches, warnings, and advisories.

4.2.2. If unexpected severe weather conditions occur, the 60 OSS/OSW will issue and transmit weather watches and warnings, following up with the 25 OWS as soon as possible.

4.3. Terms Explained:

4.3.1. Weather Watch. A special notice provided to supported customers that alerts them of a *potential* for weather conditions of such intensity as to pose a hazard to life or property for which the customer must take protective action. [Table 7](#). shows the weather watches for Travis AFB.

Table 7. Weather Watch Criteria (Issued by 25 OWS).

Criteria	Desired Lead-Time
Hail $\frac{3}{4}$ inch or greater	4 hours
Surface winds 50 knots or greater	4 hours
Lightning <i>expected</i> within 5 NM	30 minutes

4.3.2. Weather Warning. A special notice provided to supported customers that alerts them to weather conditions of such intensity as to pose a hazard to life or property. A weather warning is issued for situations that require the supported agency to take protective action. Weather warnings for Travis AFB cover an area within a 5 NM radius of the center of the runway complex. [Table 8.](#) shows the weather warning criteria used at Travis.

Table 8. Weather Warning Criteria (Issued by 25 OWS).

Criteria	Desired Lead-Time
Tornado	5 minutes
Hail greater than or equal to $\frac{3}{4}$ -inch diameter	2 hours
Surface wind 50 knots or greater	2 hours
Surface wind greater or equal to 35 knots but less than 50 knots	1 hour
Freezing precipitation (freezing rain or freezing drizzle)	30 minutes
Heavy rain (2 inches or more in 12 hours)	2 hours
(Issued by 60 OSS/OSW)	
Lightning <i>actually observed</i> within 5 NM	When Observed

4.3.3. Weather Advisory. A special notice provided to supported customers that alerts them to weather conditions that could affect their operations. Weather advisories for Travis AFB cover an area within a 5 NM radius of the center of the runway complex and are canceled when the weather conditions are no longer observed. [Table 9.](#) lists the observed weather advisories used at Travis AFB.

4.3.4. Actual Lead-Time (ALT). The elapsed time between the issuance of a Forecast Weather Advisory or Weather Warning and the first occurrence of the event.

4.3.5. Desired Lead-Time (DLT). The minimum amount of advance notice a supported agency needs to react to an advisory or warning (within the limits of state-of-the-art forecast capabilities).

4.3.6. False Alarm Rate (FAR). The number of weather warnings and/or advisories verified with positive lead-time divided by the total number of warnings issued. For example: four warnings were issued, one occurred with positive lead-time--FAR is 75%.

4.3.7. Severe Weather Action Procedure (SWAP). The procedures 60 OSS/OSW personnel follow in anticipation of a severe weather event.

4.3.8. Severe Weather Action Team (SWAT). Personnel either notified or recalled during a severe weather event.

Table 9. Observed Weather Advisory Criteria (Issued by 60 OSS/OSW).

Criteria	Desired Lead Time
Moderate or greater icing, not associated with thunderstorms, below 10,000 feet MSL	Observed
Moderate or greater turbulence, not associated with thunderstorms, below 10,000 feet MSL	Observed
Surface winds greater than or equal to 25 knots	Observed
Crosswinds greater than or equal to 19 knots with a wet runway	Observed
Crosswinds greater than or equal to 12 knots with a wet runway	Observed – TACAMO Only
Low-level wind shear (LLWS) below 2,000 feet	Observed
Vis < 300' (1/16 mile)	Observed

4.4. Warning, Watch, and Advisory Support Abilities:

4.4.1. 60 OSS/OSW coordinates customer desired lead-times for weather warnings, watches, and advisories. Users of these determine, from technical order specifications or through other means, the time required to protect base resources from various weather threats. This minimum reaction time is the basis for desired lead-time for warnings, watches and advisories.

4.4.2. Supported agencies must understand that FARs will increase as the DLT is increased. It is operationally critical that DLTs be confined to the actual minimum reaction time required.

4.4.3. The 60 OSS/OSW will use the SWAP to activate the SWAT during after hour's severe weather events, before the events are forecasted to occur.

4.5. Dissemination of Weather Watches, Warnings, and Advisories.

4.5.1. The 25 OWS forecaster disseminates forecast weather watches and warnings to base agencies through NTFS. The 60 OSS/OSW disseminates observed weather warnings and advisories to base agencies through NTFS (see [Attachment 4](#)). The weather station will make back-up calls to the 60 AMW Command Post, Base Operations, and Navy Operations to verify receipt of all watches, warnings, and/or advisories issued. See [Attachment 4](#) for progressive notification system used to pass Weather Watches, Warnings and Observed Weather Advisories throughout Travis AFB. This scheme does not include further internal notification within using activities. Each watch, warning, or advisory is numbered sequentially. The first two numbers indicate the month and the last three numbers indicate the actual number of the watch, warning, or advisory (e.g., 10-003 is the third issued in October).

5. Dissemination of Weather Information.

5.1. **General:** The 60 OSS/OSW will assist supported agencies in maintaining an efficient, effective means of disseminating weather information. Procedures developed must ensure that weather person-

nel do not spend more time communicating than monitoring weather conditions. These procedures must also ensure the information is received by those who need it, which may require inter-unit dissemination. Due to limited manning and the time-critical nature of this information, 60 OSS/OSW expects agencies with New Tactical Forecast System (NTFS) terminals to use them to their fullest potential, along with the Local Weather Sheet and Travis AFB Weather Homepage, prior to contacting 60 OSS/OSW. Agencies without NTFS terminals, who have a valid and regular need for weather data, should contact 60 OSS/OSW for assistance in acquiring a terminal.

5.2. Terms Explained:

5.2.1. New Tactical Forecast System (NTFS). This computer system is used to acquire, process, display, and disseminate weather information. NTFS consists of a central processor located at the weather station. There are data display terminals located in operational facilities on base (RAP-CON, control tower, and command post) linked to the NTFS server located in the weather station. Forecasters use NTFS to display weather maps and other information. The NTFS is used to transmit and receive weather observations and forecasts for local and off-base agencies. The NTFS is also the primary dissemination tool for local weather watches, warnings, and advisories.

5.2.2. Longline Communications. Communications circuits that deliver weather products via Satellite and NIPERNET Common User Communications (CUC).

5.2.3. Local Communications. Weather products (TAFs, observations, PIREPs, etc.) are typically encoded differently for longline and local transmissions. Vital weather data for aircraft safety is now dependent upon the base network.

5.2.4. Pilot Reports (PIREPs). Pilot reports of airborne weather conditions. A PIREP should include the location and flight level of the aircraft, time of observation, aircraft type, and description and extent of meteorological elements. PIREPs are normally transmitted both locally and longline.

5.2.5. Automated Meteorological Information System (AMIS). The software suite designed for the NTFS.

5.3. New Tactical Forecast System (NTFS):

5.3.1. The primary means of disseminating weather information on Travis AFB is via NTFS. Those units that do not have an NTFS terminal but require various weather information (i.e., weather warnings and advisories) should use the following websites:

http://132.33.152.122:82/pv/local_top.htm Local Weather Sheet.

<http://isxdmtweb1\60oss\Weather\index.html> Travis AFB Weather Homepage.

5.3.2. The NTFS is used to disseminate the following information:

5.3.2.1. Travis AFB observations.

5.3.2.2. Travis AFB TAFs and amendments.

5.3.2.3. Travis AFB weather warnings, watches, and advisories.

5.3.2.4. 12-hour local weather forecast with hourly temp, dew point, and pressure altitude.

5.3.3. The following applies to all NTFS local transmissions:

5.3.3.1. All wind directions are in degrees magnetic.

5.3.3.2. All weather observation and TAF heights are AGL. Other products, such as weather advisories, reference MSL and AGL as appropriate, but are normally in reference to MSL.

5.3.3.3. All observation distances are in statute miles. All warning/watch/advisory distances are in nautical miles.

5.3.3.4. Wind speeds are in knots.

5.3.3.5. All times are in ZULU time (Z) unless the time is appended with an "L", in which case it is local time.

5.3.4. Those units possessing an NTFS terminal must monitor their system for operational status. Each agency experiencing an outage of their NTFS will report it to 60 OSS/OSW so back-up procedures may be arranged and maintenance actions taken. When the NTFS system is inoperative, the WF will locally disseminate weather data to the agencies listed in [Attachment 4](#). If a telephone is used (voice fax, runner, etc.), a read-back of disseminated weather information is required and logged on Travis AFB Form 127, **Dissemination Log**. This type of transmission is known as voice relay.

5.4. Weather Warnings, Watches, and Advisories Dissemination: The timely dissemination of weather warnings, watches, and advisories is critical to the ability of units to prepare/respond to the threat of dangerous/mission limiting weather. Warnings, watches, and advisories are transmitted to customers using the NTFS system. See [Attachment 4](#) for a detailed matrix of the recipients of Travis AFB warnings, watches, and advisories.

5.5. Information from the Alternate Weather Operations Site (AWOS): Information transmitted from the AWOS will be slightly degraded, because observations will be sent via the Internet, and the 60 OSS/OSW will be relying on tactical equipment to produce MEF products. Unless the 25 OWS goes down, TAFs, weather warnings, watches, and advisories will still be transmitted via NTFS from the 25 OWS.

6. Special Mission Requirements.

6.1. General: The previous chapters outlined support requirements for the vast majority of the operations on Travis AFB. Information on units requiring unique support is outlined in this chapter. Any special support requirements not covered here should be coordinated with 60 OSS/OSW at least 10 working days prior to the start of the support.

6.2. 60 AMW Commander and Staff: 60 OSS/OSW will provide weather briefings at scheduled 60 AMW staff meetings and upon request. 60 OSS/OSW will also respond to any recall as required by the 60 AMW Commander.

6.3. 60 AMW Safety: 60 OSS/OSW will:

6.3.1. Provide meteorological data and/or personnel to assist in the investigation of ground or aircraft mishaps, as required.

6.3.2. Provide personnel to Wing Safety to serve as accident board members.

6.4. 60th Communications Squadron (60 CS): 60 OSS/OSW will notify the 60 CS focal point of all communications and support equipment outages, interruptions, and restorals. Weather personnel will open and close all job control numbers regarding meteorological and communications support equipment with customer service, except NTFS outages not related to local circuits.

6.5. 60th Operations Support Squadron Air Traffic Control (60 OSS/OSAB): The 60 OSS/OSW will provide training and certification for air traffic control personnel to take limited weather observations and to participate in the Cooperative Weather Watch Program as described in Chapter 7.

7. Reciprocal Support.

7.1. Travis Consolidated Command Post (60 AMW/CP). Consolidated Command Post will:

7.1.1. Relay selected weather warnings, watches, and advisories from 60 OSS/OSW to the base leadership, airborne aircraft, and the Travis AFB operations complex as required.

7.1.2. Ensure 60 OSS/OSW receives current copies of Computer Flight Plans (CFP) as soon as possible, preferably three hours prior to takeoff so they may begin preparation of flight weather briefings.

7.1.3. Consolidated Command Post will notify 60 OSS/OSW of:

7.1.3.1. Any real-world or exercise incidents, briefings, or events involving or requiring weather support.

7.1.3.2. Weather requirements/criteria for routing and/or special missions.

7.1.3.3. Air refueling route changes.

7.1.3.4. All aircraft cancellations and diversions due to weather.

7.1.3.5. Refueling area weather reported by aircrews.

7.1.3.6. Any aircraft mishaps involving 60 AMW assets.

7.1.3.7. Any malfunctions or outages of their NTFS equipment.

7.2. 349 AMW Control Center (349 AMW/CP). 349 AMW Control Center will:

7.2.1. Relay selected weather warnings, watches, and advisories from 60 OSS/OSW to 349 AMW leadership and subordinate units as required.

7.2.2. Notify 60 OSS/OSW of any real-world or exercise incidents, briefings, or events involving or requiring weather support.

7.3. 60th Operations Support Squadron Base Operations (60 OSS/OSAA). Base Operations will:

7.3.1. Notify 60 OSS/OSW of all aircraft emergencies/mishaps via secondary crash phone network.

7.3.2. Disseminate weather warnings, watches, and advisories over the secondary crash phone network.

7.3.3. Take appropriate Notice to Airman (NOTAM) action when notified by the WF of change in the operational status of the Runway Visual Range (RVR) system.

7.3.4. Notify 60 OSS/OSW immediately of all changes in runway conditions.

7.3.5. Notify 60 OSS/OSW of the temporary absence of personnel in the base operations work center (i.e., "Base Operations Zero"). Notify the WF as soon as practical once Base Operations Zero is over and normal operations return.

7.3.6. Update the FLIP per AFMAN 15-129, Table 11.1.

7.4. 60th Operations Support Squadron Control Tower (60 OSS/OSAB). Control Tower will:

7.4.1. Notify 60 OSS/OSW of runway changes. Note: unless told otherwise, when tower notifies weather that 21 or 03 is the primary runway, weather will use 21L or 03R respectively.

7.4.2. Participate in the Cooperative Weather Watch Program. This requires notification of the 60 OSS/OSW personnel when any of the following weather conditions occur and are not in the latest available observation. Notify 60 OSS/OSW when:

7.4.2.1. Precipitation starts or stops.

7.4.2.2. Wind gusts of 25 knots or greater, when no gusts are forecast.

7.4.2.3. Thunderstorms and/or lightning are initially observed.

7.4.2.4. Rapid decrease of visibility that lowers any sector visibility to below six miles.

7.4.2.5. Anytime special criteria for prevailing visibility listed in [Table 3](#) is met and different from what is currently being reported by the WF.

7.4.2.6. Any weather phenomena that might be considered significant.

7.4.3. Provide tower visibility when Control Tower personnel observe their prevailing visibility decrease to less than 4 SM or increase to 4 SM or more. Report all changes when their prevailing visibility at tower level is less than four miles.

7.4.4. Relay all pilot weather reports (PIREPs) to 60 OSS/OSW.

7.4.5. Relay all runway, wind sensor and light setting changes when the airfield is experiencing reduced visibility to the 60 OSS/OSW personnel.

7.4.6. Upon request by 60 OSS/OSW perform a PMSV radio check.

7.4.7. Notify 60 OSS/OSW when wind equipment is inoperative or when readings differ from visual references.

7.4.8. Provide wind sensor change to the inactive end of the runway upon request from 60 OSS/OSW.

7.4.9. Monitor 60 OSS/OSW PMSV frequency (UHF 269.2 MHz) during outages in accordance with established duty priorities, as time permits (paragraph [3.8](#)).

7.4.10. Notify 60 OSS/OSW of any malfunctions or outages of their NTFS equipment.

7.4.11. Provide Air Traffic Control indoctrination training to 60 OSS/OSW personnel upon request.

7.5. 60th Communications Squadron (60 CS). 60 CS will:

7.5.1. Maintain the weather sensing and display equipment including the base weather observing equipment, the RVR, and the base wind system. Exceptions are contract equipment maintained by civilian contractors.

7.5.2. Accept and record all outage reports and issue job control numbers.

7.5.3. Request mission impact statements from 60 OSS/OSW if not provided in initial outage.

7.5.4. Notify the responsible service agent, government, or civilian contractor for leased equipment or line problems. Maintain follow-up actions until restoration.

7.5.5. Coordinate with Superintendent, Weather Station Operations or weather personnel prior to taking equipment down for scheduled maintenance.

7.5.6. The following weather equipment restoration priorities apply (in descending order):

7.5.6.1. PMSV Radio.

7.5.6.2. GMQ-32 (Runway Visual Range).

7.5.6.3. RVR-400 (Runway Visual Range display).

7.5.6.4. FMQ-13 (Runway Winds).

7.5.6.5. GMQ-34 (Cloud Height Set).

7.5.6.6. Base LAN Communication.

7.5.6.7. FMQ-8 (Temperature/Dew point).

7.5.6.8. ML-658 (DBASI Digital Barometer).

7.5.6.9. ML-102 (Aneroid Barometer).

7.5.6.10. WSR-88D (NEXRAD Principal User Processor).

7.5.6.11. ML-17 (Rain Gauge).

7.5.6.12. Class A telephone lines.

7.5.7. Provide 60 OSS/OSW access to weather equipment technical orders.

7.6. Travis AFB Flying Squadrons (6 ARS, 9 ARS, 21 AS, 22 AS, 70 ARS, 79 ARS, 301 AS 312 AS) and Tenant Unit (TACAMO). Flying units will:

7.6.1. Advise 60 OSS/OSW of any changes in operational requirements to include weather warnings, watches, and advisories criteria.

7.6.2. Contact the 60 OSS/OSW for planning and mission execution weather.

7.6.3. Provide 60 OSS/OSW post-mission feedback on mission limiting phenomena.

7.6.4. Fill out AF Form 72, **Air Reports (AIREP)** and turn into any weather station (as required).

7.7. All Travis NTFS users. All agencies operating NTFS will:

7.7.1. Notify 60 OSS/OSW of any malfunctions or outages of their NTFS equipment.

7.7.2. Notify 60 OSS/OSW before NTFS equipment is moved or disconnected.

7.8. 25 OWS: The 25 OWS will:

7.8.1. The support provided between the 25 OWS and 60 OSS/OSW is outlined in a separate Memorandum of Agreement.

7.9. 60th Current Operations Flight (60 OSS/OSO). Current Operations will:

7.9.1. Provide 60 OSS/OSW with weekly flying schedules and provides daily updates/changes.

7.10. 60th Public Affairs (60 AMW/PA). Public Affairs will:

7.10.1. Provide and screen requests for weather support and climatological data from non-DoD sources.

8. Forms Adopted. DD Form 175-1, **Flight Weather Briefing**, AMC Form 181-1, **AMC Mission Weather Briefing**, AF Form 72.

9. Prescribed Forms. Travis AFB Form 127, **Dissemination Log**, Travis AFB Form 128, **Weather Local Briefing Sheet**, and Travis AFB Form 145, **Pilot-to-Metro Contact Log Sheet**.

MICHAEL L. SEVIER, Col, USAF
Vice Commander, 60 AMW

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFMAN 15-111, *Surface Weather Observations*

AFMAN 15-124, *Meteorological Codes*

AFMAN 15-125, *Weather Station Operations*

AFPD 15-1, *Atmospheric and Space Environmental Support*

AMCI 15-101, *AMC Weather Operations*

MOA between 25 OWS and 60 OSS/OSW

Abbreviations and Acronyms

AFWA—Air Force Weather Agency, Offutt AFB NE

AFMAN—Air Force Manual

AGL—Above Ground Level

AIREP—Air Report

ALSTG—Altimeter Setting

AMIS—Advanced Meteorological Information System

AMW—Air Mobility Wing

ATAD—Automatic Telephone Answering Device

ATC—Air Traffic Control

ATCALS—Air Traffic Control and Landing System

AWN—Automated Weather Network

BECMG—Becoming

BKN—Broken Sky Condition

BWW—Basic Weather Watch

CAT—Crisis Action Team

CFP—Computer Flight Plan

CIG—Ceiling

CLR—Clear

CWT—Combat Weather Team

CWW—Cooperative Weather Watch

DBASI—Digital Barometer Altimeter Setting Indicator

DLT—Desired Lead Time

EW O—Emergency War Order

FAA—Federal Aviation Administration

FAR—False Alarm Rate

FEW—Few Sky Condition

FCST—Forecast

WX—Weather

Z—ZULU Time

Attachment 2

NTFS WEATHER DISSEMINATION FORMATS

A2.1. Observation Format.

A2.1.1. Station Identifier.

A2.1.1.1. **KSUU** METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK PK WND 18031/33 FRQ LTGICCCCG TS ALQDS MOV E

A2.1.2. Type and Time of Observation.

A2.1.2.1. KSUU **METAR 1055Z** 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK PK WND 18031/33 FRQ LTGICCCCG TS ALQDS MOV E

A2.1.2.2. METAR observations are regularly scheduled “hourly” observations, which are taken between 55 and 59 minutes after every hour. The time of a METAR is the time the last element was observed.

A2.1.2.3. SPECI observations are “special” observations taken when any of the criteria listed in, [Table 3](#), is observed. The time of the SPECI is the time the criteria are first observed. A single-element SPECI may be taken to quickly transmit a tornadic observation.

A2.1.2.4. Local observations are taken when any of the criteria listed in [Table 3](#), and [Table 4](#), is observed. The time of the local is the time the criterion occurs. NOTE: Locals taken for runway changes are taken several minutes after notification to allow for stabilization of meteorological instruments on the newly activated runway.

A2.1.3. Wind.

A2.1.3.1. KSUU METAR 1055Z **19012G25KT** 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33

A2.1.3.2. Direction (magnetic) **from which** the wind is blowing. Reported in tens of degrees using three digits. In the example above, the wind is blowing from 190 degrees.

A2.1.3.3. Speed is encoded in two digits (or three for winds of 100 knots or more). In the example above, the wind speed is 12 knots.

A2.1.3.4. Gusts are encoded in two digits (three for gusts of 100 knots or more). In the example above, the wind has gusted to 25 knots during the period of observation (10 minutes).

A2.1.4. Visibility.

A2.1.4.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33

Visibility is reported in statute miles and fractions thereof.

A2.1.5. Present Weather.

A2.1.5.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33.

A2.1.5.2. Weather or obscuring phenomena occurring at the station is encoded in the body of the observation (as indicated in the example above).

A2.1.5.3. Weather observed at a distance, but not occurring at the station is encoded in the remarks (RMK) section of the observation.

A2.1.5.4. See **Table A2.1** for a breakdown of present weather codes.

A2.1.6. Sky Condition.

A2.1.6.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33

A2.1.6.2. Layer amounts are reported in octas; SKC=Clear, FEW=1/8 to 2/8ths, SCT=3/8 to 4/8ths, BKN=5/8 to 7/8ths, OVC=8/8ths.

A2.1.6.3. Encoded in ascending order up to the lowest overcast layer.

A2.1.6.4. "VV" indicates vertical visibility when a surface-based obscuring phenomenon (e.g., dense fog) obscures the entire sky.

A2.1.6.5. Heights are given in hundreds of feet using three digits.

A2.1.6.6. A ceiling is considered as the height of the lowest BKN or OVC layer aloft, or the vertical visibility (VV) into a surface-based obstruction.

A2.1.6.7. A cloud layer followed by "CB" indicates cumulonimbus.

A2.1.7. Temperature and Dew Point.

A2.1.7.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33

A2.1.7.2. Reported in degrees Celsius.

A2.1.7.3. A solidus separates temperature and dew point.

A2.1.8. Altimeter Setting.

A2.1.8.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALQDS MOV E FRQ LTGICCCCG PK WND 18031/33

A2.1.8.2. Altimeter is in reference to inches of mercury (Hg).

A2.1.9. Remarks.

A2.1.9.1. KSUU METAR 1055Z 19012G25KT 1 ½ -TSRA SCT015CB OVC030 26/20 ALSTG 29.80 RMK TS ALODS MOV E FRO LTGICCCCG PK WND 18031/33

A2.1.9.2. Remarks are included to expand upon elements in the body of the observation. Remarks follow the remark (RMK) indicator.

A2.1.9.3. Movement of significant features will be indicated by the contraction "MOV," followed by the direction **towards which** the feature is moving.

A2.1.9.4. Distances (from the station) of significant features are in statute miles.

A2.1.9.5. In the example above, a thunderstorm is observed in all quadrants (ALQDS-every direction in relation to the station) and is moving towards the east. Frequent lightning (FRQ LTG)

is observed in-cloud (IC), cloud-to-cloud (CC), and cloud-to-ground (CG); and the peak wind (PK WND) during the preceding hour was from 180 degrees, was 31 knots, and occurred at 33 minutes past the hour.

Qualifier			Weather Phenomena	
Intensity	Descriptor	Precipitation	Obscuration	Other
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Well Developed Dust/ Sand Whirls
Moderate	PR Partial	RA Rain	FG Fog	SQ Squall
+ Heavy	BC Patches	SN Snow	FU Smoke	FC Funnel Cloud, Tornado, or Water Spout
VC Vicinity	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	SS Sand Storm
	BL Blowing	IC Ice Crystals	DU Dust	DS Dust Storm
	SH Showers	PL Ice Pellets	SA Sand	
	TS Thunderstorm	GR Hail	HZ Haze	
	FZ Freezing	GS Small Hail or Snow Pellets	PY Spray	
		UP Unknown Precipitation		

A2.2. Terminal Aerodrome Forecast (TAF) FORMAT.

A2.2.1. Station and Forecast Identifiers.

A2.2.1.1. **KSUU FCST** 0112-0212 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

TEMPO 16-02 1 +SHRA BKN025 OVC050.

BECMG 02-03 18012G22KT 7 SKC ALSTG 30.05INS T30/21Z T22/11Z

A2.2.2. Valid Time Period.

A2.2.2.1. KSUU FCST **0112-0212** 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.2.2. 0112-0212 The first two digits (01) is the date and the second two digits (12) is the time (in Zulu).

A2.2.2.3. Forecast period is 24 hours, except for amendments. Amendments are valid from the whole hour during which the amendment is issued, until the end of the regular forecast period. In the example above, if an amendment is issued at 1515Z, the valid time of the amended forecast would read "0115-0212."

A2.2.3. Wind.

A2.2.3.1. KSUU FCST 0112-0212 **15012G25KT 5** – RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.3.2. Direction (magnetic) **from which** the wind is expected to blow. Reported in tens of degrees using three digits. In the example above, the wind is forecast to blow from 150 degrees.

A2.2.3.3. Speed is encoded in two digits (or three for winds of 100 knots or more). In the example above, the forecast wind speed is 12 knots.

A2.2.3.4. Gusts are encoded in two digits (three for gusts of 100 knots or more). In the example above, wind gusts of 25 knots are forecast.

A2.2.4. **Visibility.**

A2.2.4.1. KSUU FCST 0112-0212 15012G25KT **5** – **RA** SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.4.2. Visibility is reported in statute miles and fractions thereof.

A2.2.5. **Forecast Weather.**

A2.2.5.1. KSUU FCST 0112-0212 15012G25KT 5 – **RA** SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.5.2. ‘NSW’ (no significant weather) will be used to specify the termination of all obstructions and/or predominant weather for the period of the forecast.

A2.2.6. **Sky Condition.**

A2.2.6.1. KSUU FCST 0112-0212 15012G25KT 5 – RA **SCT090 BKN140 OVC250** LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.6.2. Layer amounts are reported in octas; SKC=Clear, FEW=1/8 to 2/8ths, SCT=3/8 to 4/8ths, BKN=5/8 to 7/8ths, OVC=8/8ths.

A2.2.6.3. Encoded in ascending order to report all forecast cloud (or obscuring phenomena aloft layers).

A2.2.6.4. “VV” indicates vertical visibility when a surface-based obscuring phenomenon (e.g., dense fog) is expected to obscure the entire sky.

A2.2.6.5. Heights are given in hundreds of feet using three digits (in AGL – Above Ground Level).

A2.2.6.6. A ceiling is considered as the height of the lowest BKN or OVC layer aloft, or the vertical visibility (VV) into a surface-based obscuration.

A2.2.7. **Icing.**

A2.2.7.1. KSUU FCST 0112-0212 15012G25KT 5 – RA SCT090 BKN140 OVC250 **LGT RIME ICG 020-080** LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.7.2. Intensity and type of icing is established by AFMAN 15-124 and is required in forecasts when icing is expected below 10,000 feet above ground level. Intensities are reported as: LGT = Light, MOD = Moderate, SVR = Severe. Type is reported as RIME = Rime, MXD = Mixed, CLR = Clear. The example shows light rime icing.

A2.2.7.3. Bases and tops of icing are encoded in ascending order in three digits using thousands of feet. The example shows the base of the icing begins at the 2,000 feet above the surface and extends to 8,000 feet above the surface.

A2.2.8. Turbulence.

A2.2.8.1. KSUU FCST 0112-0212 15012G25KT 5 – RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 **LGT TURBC SFC-050** ALSTG29.97INS.

A2.2.8.2. Intensity of turbulence is established by AFMAN 15-124 and requires turbulence be specified for Category II type aircraft in the forecast below 10,000 feet above ground level.

A2.2.8.3. Aero Club aircraft are Category I aircraft; C-5 aircraft are Category II aircraft, and KC-10 aircraft are Category III. Turbulence for Category II aircraft can be converted to turbulence for other category aircraft using the following table:

AIRCRAFT CATEGORY			
I	II	III	IV
N	N	N	N
(L)	N	N	N
L	(L)	N	N
L-(M)	L	(L)	N
M	L-(M)	L	(L)
M-(S)	M	L-(M)	L
S	M-(S)	M	L-(M)
S-(X)	S	M-(S)	M
X	S-(X)	S	M-(S)
X	X	S-(X)	S
X	X	X	S-(X)
X	X	X	X

NOTES:

NOTE 1:

() = Occasional (less than 1/3 of the time)

NOTE 2:

N = None

L = Light

M = Moderate

S = Severe

X = Extreme

NOTE 3:

Use caution when converting extreme turbulence reports between various types of aircraft. Extreme turbulence is defined as "The aircraft is violently tossed about and practically impossible to control. Structural damage may occur. Rapid fluctuations in air speed are > 25 knots. The vertical gust velocity is > 50 feet/second. Extreme turbulence is rarely encountered. It is usually found in the strongest thunderstorms and wind sheer."

A2.2.8.4. Encoded in ascending order to report all forecast turbulence below 10,000 feet above ground level.

A2.2.8.5. Bases and tops of turbulence are encoded in three digits using thousands of feet. The example shows the base of the turbulence begins at the surface and extends to 5,000 feet above the surface.

A2.2.9. Minimum Altimeter Setting.

A2.2.9.1. KSUU FCST 0112-0212 15012G25KT 5 – RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A2.2.9.2. Altimeter is in reference to inches of mercury (Hg).

A2.2.9.3. Forecasted value is the minimum altimeter expected for the time covered in the applicable forecast group.

A2.2.10. Temporary Condition Groups. (TEMPO).

A2.2.10.1. TEMPO 16-02 1 +SHRA BKN025 OVC050.

A2.2.10.2. Indicates a temporary fluctuation to forecast conditions (e.g., intermittent rain).

A2.2.10.3. May contain all, some, or just one of the elements (excluding altimeter setting) listed in the above paragraphs.

A2.2.10.4. When used, the valid time for the forecast intermittent conditions is from whole hour to whole hour as listed immediately after the TEMPO identifier. In the example above, the intermittent conditions are expected to occur from 16Z until 02Z.

A2.2.11. Change Groups. (BECMG).

A2.2.11.1. BECMG 02-03 18012G22KT 7 SKC ALSTG 30.05INS T30/21Z T22/11Z.

A2.2.11.2. Used to indicate a change in forecast conditions expected to occur within a specified time period.

A2.2.11.3. The specified time period will normally be one hour and will never exceed two hours. BECMG groups will contain all elements.

A2.2.11.4. The valid time of this group will be from the end time of the change, to the ending time of either forecast period or until the ending time of a subsequent BECMG group. In the example above, the change is forecast to begin after 02Z and end at 03Z. Therefore, the valid time for the conditions within the BECMG group would be from 03Z until the end of the forecast (12Z) since there are no subsequent BECMG groups.

A2.2.12. Remarks.

A2.2.12.1. BECMG 02-03 18012G22KT 7 SKC ALSTG 30.05INS T30/21Z T22/11Z.

A2.2.12.2. Remarks (if any) are always the last entries for each forecast group. Forecast maximum and minimum temperatures in Celsius, and projected hour (Z) of occurrence are included on the last line of the forecast.

Attachment 3**WEATHER WARNING /WATCH /ADVISORY DISSEMINATION FORMATS****A3.1. Weather Advisory.**

RECEIVED 23/1440Z
TRAVIS AFB OBSERVED WEATHER ADVISORY 12-011
VALID 23/1440Z (23/0740L) TO UFN (UFN)
(WIND DIRECTION) SURFACE WINDS EQUAL TO OR GREATER THAN 25
KNOTS ARE BEING OBSERVED AT TRAVIS AFB. IF, REPEAT,
IF SURFACE WINDS GREATER THAN 35 KNOTS ARE FORECAST,
A SEPARATE WEATHER WARNING WILL BE ISSUED. MAX WIND
EXPECTED 34 KNOTS.

MINUTE SENT/ ISSUING FORECASTER

A3.2. Weather Watch:

RECEIVED 23/1330Z
TRAVIS AFB FORECAST WEATHER WATCH 12-011
VALID 23/1400Z (23/0600L) TO 23/1530Z (23/0730L)
POTENTIAL, (REPEAT) THE POTENTIAL EXISTS FOR LIGHTNING
WITHIN 5 NAUTICAL MILES OF TRAVIS AFB A WARNING WILL
BE ISSUED IF REQUIRED

A3.3. Weather Warnings:

RECEIVED 23/2116Z
TRAVIS AFB WEATHER WARNING 12-013
VALID 23/2300Z (23/1500L) TO 24/0400Z (23/2000L)

(WIND DIRECTION) SURFACE WINDS EQUAL TO OR GREATER THAN 35 KNOTS, BUT LESS THAN 50 KNOTS, ARE EXPECTED WITHIN 5 NAUTICAL MILES OF TRAVIS AFB. MAX WIND EXPECTED 49 KNOTS.

RECEIVED 23/1400Z
TRAVIS AFB WEATHER WARNING 12-017
VALID 23/1400Z (23/0700L) TO UFN (UFN)

LIGHTNING HAS BEEN OBSERVED WITH IN FIVE NAUTICAL MILES
OF TRAVIS AFB

Attachment 4

TRAVIS AFB SEVERE WEATHER NOTIFICATION DIAGRAM

25 OWS (contacts 60 OSS/OSW)					
60 OSS/OSW (contacts the following in turn)					
Command Post (Contacts TAB A)	Base Operations (Contacts TAB B)	Navy Ops	KC-10 SIM* Boeing	C-5 SIM* Flight Safety	C-5 TNG* LB&B

*Lightning Only
*ATTACHMENT 4, TAB A
COMMAND POST SEVERE WEATHER NOTIFICATION

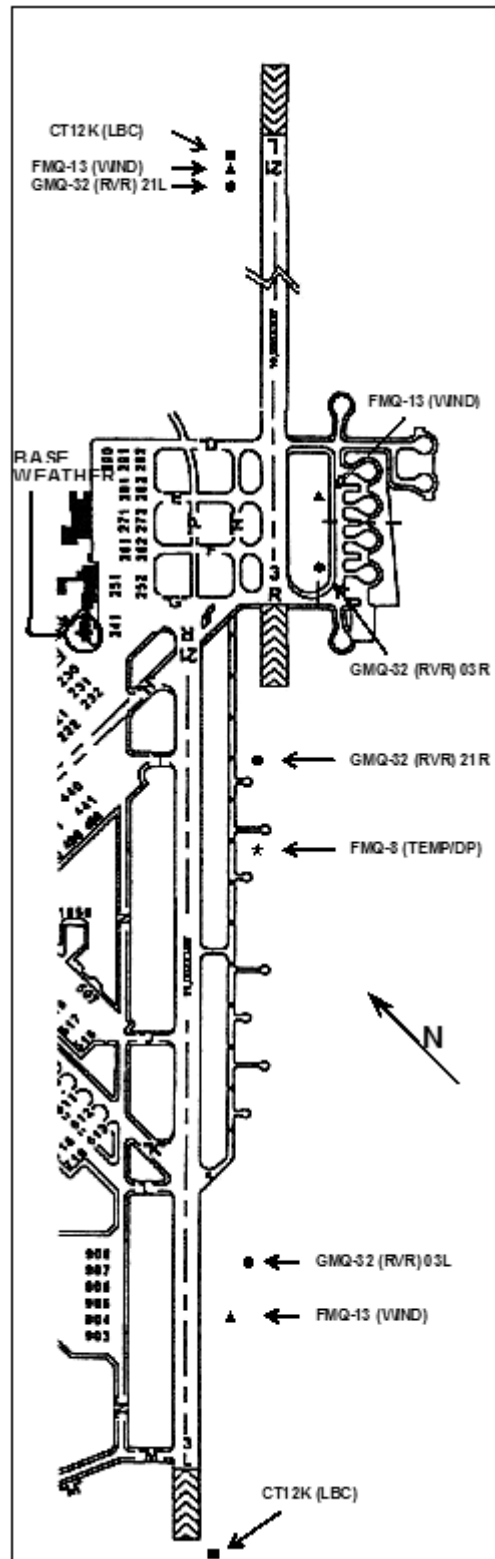
Command Post (Contacts the following in turn)		
60 AMW/CC	Base Ops	LRS
60 OG/CC	Security Forces	60 CS Focal Point
60 MXG/CC	9 ARS	DGMC
60 MSG/CC	6 ARS	POL
60 AMW/DS	21 ARS	Solano Dispatch
CP/CC	22 ARS	349 AMW Control Center (Contacts TAB A1)
MOC 1/Maint Control	Boeing	

ATTACHMENT 4, TAB A1
349 AMW CONTROL CENTER NOTIFICATION DIAGRAM

349 AMW Control Center (Contacts the following in turn)		
349 AMW/CC/XP/PA/RS/SE	349 CS	312 AS
45/55/82 APS	349 MDS	70 ARS
349 OG/OGV	349 DOV	349 MSS/SV
349 AMW/OSF	749 AGS	349 CH
301 AS	349 ALCP	349 AES
79ARS	349 ASTS	349 SFS
349 CES	349 SPTG	945 AGS

ATTACHMENT 4, TAB B				
BASE OPERATIONS SEVERE WEATHER NOTIFICATION PYRAMID				
Base Operations (Contacts by phone and Secondary Crash Alert System (SCAS))				
By Phone	Members of SCAS			
Aero Club	Command Post	EOD	MSG/CC Admin	CEO
Tower (calls RAPCON)	Fire Department	Security Forces	Base Weather	VEH Dispatch
	DGMC	MSS/CCQ	CE Readiness	Chaplin
	349 AMW	Judge Advocate	Safety	

METEOROLOGICAL EQUIPMENT LOCATIONS



Attachment 6

TRAVIS AFB LOCAL WEATHER SHEET

Received 01/1959Z
KSUU FCST 0120-0220 01015KT 7 SCT100 SCT200 ALTIMETER30.38INS
BECMG 11-12 VRB06KT 3 BR SCT120 BKN200 ALTIMETER30.30INS
BECMG 16-17 35009KT 7 NSW SCT200 ALTIMETER30.32INS TEMP 12C
AT 2200Z TEMP 03C AT 1300Z 59/JWT

Received 01/2041Z
TRAVIS AFB LOCAL WEATHER SHEET FEB 2002
VALID 01/2100Z (01/1300L) TO 02/0800Z (02/0000L)

THIS PRODUCT IS NOT AMENDED NOR UPDATED. CALL 424-3003 FOR BRIEFING

HR(Z)	21	22	23	00	01	02	03	04	05	06	07	08
TMP(C)	+11	+12	+12	+11	+09	+07	+06	+05	+04	+04	+04	+03
DP(C)	+04	+04	+04	+04	+04	+04	+04	+03	+03	+02	+02	+01
PA(FT)	—	—	—	—	—	—	—	—	—	—	—	-350
	330	320	310	300	300	310	320	330	340	340	350	

	AVG TMP DEV	CLIMB WINDS
FL240	-02	260/20
FL300	-03	260/25
FL340	-03	60/25
FL390	-02	260/30

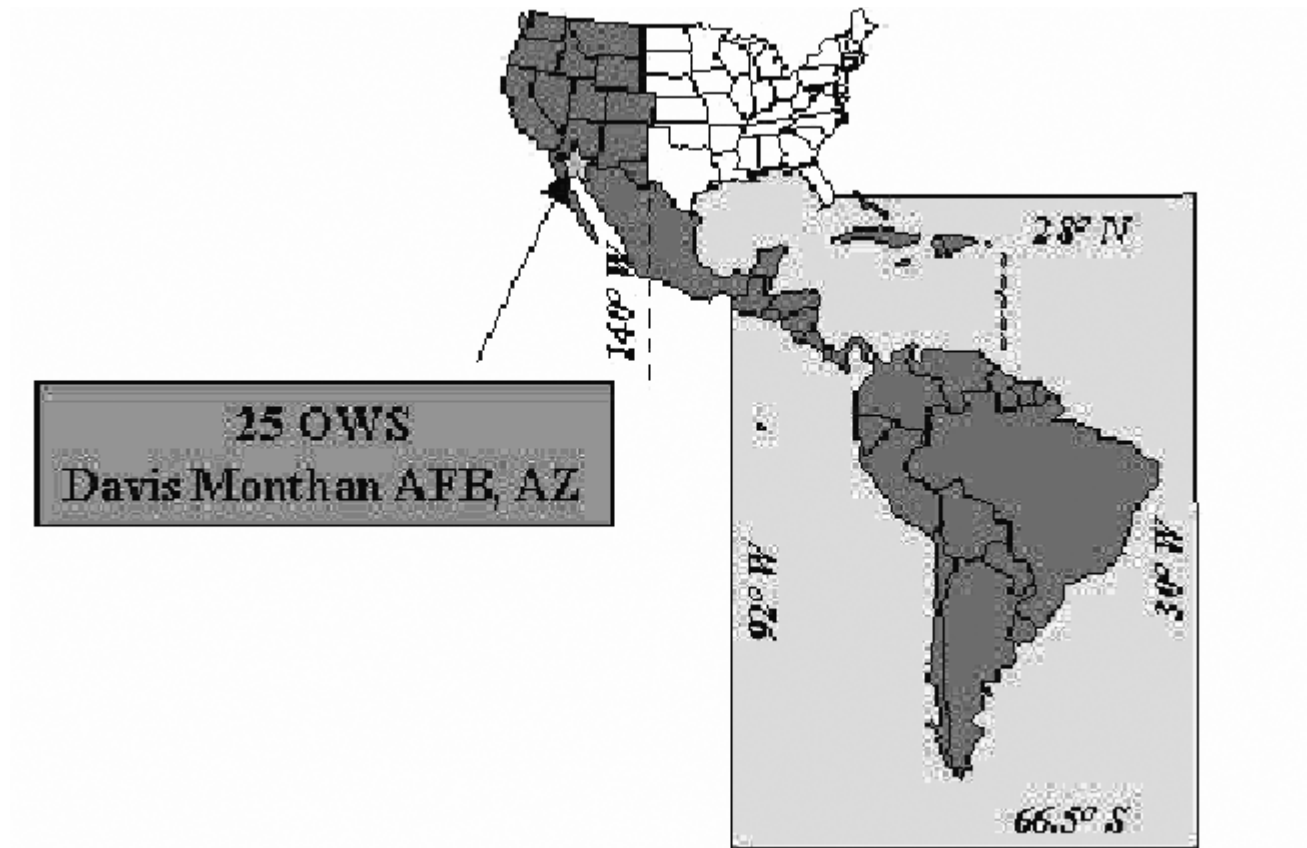
LOCAL FLYING AREA HAZARDS
TURBC: NONE
ICING: NONE
THUNDERSTORMS: NONE

SUNSET:	01/1730L
SUNRISE:	02/0712L
FRZLVL:	6,400FT

FORECAST W-285 / W-283
CLOUDS: SKC VIS 7
HAZARDS: NONE
CONTRAILS: 260 - 550

Attachment 7

25TH OPERATIONAL WEATHER SQUADRON AREA OF RESPONSIBILITY



Attachment 8

AIRCRAFT GENERAL CHARACTERISTICS AND WEATHER SENSITIVITIES



General Characteristics

Aircraft: E-6B		Name: Mercury
Manufacturer: Boeing		Category Aircraft: II
Primary Mission: Communications relay for fleet ballistic missile submarines (A and B models) and airborne command post for U.S. Strategic forces (B model)		
Power Plant: Four CFM-56-2A-2 High bypass turbofan engines		
Thrust: 21,634 pounds per engine		Max Speed: 522 Kts (.79 mach)
Max Range: 6,600 NM		Ceiling: 40,000+ feet
Length: 150 feet, 4 inches		Height: 42 feet, 5 inches
Wing Span: 148 feet, 4 inches		Max Take-off Weight: 342,000 pounds
Crew: Four		
Payload: 10 mission specialist (A model); 18 mission specialist (B model)		
Weather Sensitivities		
Max X-Wind Comp: 32Kts (Dry Runway)		
RCR	Wet Runway	Ice on Runway
Max X-Wind for RCR #:	12.5	5
Induction Icing Thresholds:		

Icing: Must avoid SVR	Turbulence: Must avoid SVR
Lightning/TSTMS: Avoid all thunderstorms	In-Flight Refueling: Vsby \geq 1NM
Radar: Weather radar installed	
Remarks: Cannot fly though National Weather Service issued Weather Warning areas	



General Characteristics

Aircraft: KC-10A	Name: Extender
Manufacturer: McDonnell Douglas	Category Aircraft: III
Primary Mission: In-flight refueling and long-range cargo transport	
Power Plant: Three General Electric CF6-50C2 turbofan engines	
Thrust: 52,500 pounds per engine	Max Speed: 538 Kts (.82 mach)
Max Range: 10,000 NM	Ceiling: 42,000 feet
Length: 181 feet, 7 inches	Height: 58 feet, 1 inches
Wing Span: 165 feet, 4.5 inches	Max Take-off Weight: 590,000 pounds
Crew: Four	
Payload: 342,000 pounds of transfer fuel and 75 passengers or 27 pallets or max cargo payload of 169,409 pounds of cargo	

Weather Sensitivities			
Max X-Wind Comp: 30Kts			
RCR	0 to 5	6 to 8	> 8
Max X-Wind for RCR #:	No Ops	20 (waiver required)	20
Induction Icing Thresholds: Engine anti-icing must be used when temperature is $\leq 42^{\circ}\text{F}$ with visible moisture, or when temperature and dew point temperature are within 3°F			
Icing: Limits operations		Turbulence: Will avoid areas of MDT/SVR	
Lightning/TSTMS: Avoid by 10NM below FL230 and 20NM at and above		In-Flight Refueling: Vsby $\geq 1/2\text{NM}$	
Radar: Weather radar installed			
Remarks: Cannot Take-off with $>.5$ inches of slush or water on runway or 4 inches of dry snow on runway. Crew may ask for Aerial Refueling (AR) route forecast			



General Characteristics	
Aircraft: C-5B	Name: Galaxy
Manufacturer: Lockheed Georgia	Category Aircraft: II
Primary Mission: Outsized cargo transport	
Power Plant: Four General Electric TF-39 turbofan engines	
Thrust: 41,000 pounds per engine	Max Speed: 541 Kts (.72 mach)
Max Range: 6,320 NM	Ceiling: 43,500 feet

Length: 247 feet, 10 inches					Height: 65 feet				
Wing Span: 222 feet, 9 inches					Max Take-off Weight: 840,000 pounds				
Crew: Seven									
Payload: Two M-1 Main Battle Tanks or six AH-64 Apache attack helicopters or six Bradley vehicles or three CH-47 helicopters or 74 ton mobile bridge or 340 passengers in airbus mode									
Weather Sensitivities									
Max X-Wind Comp: 35Kts									
RCR	3	4	5	6	7	8	9	10	11
Max X-Wind for RCR #:	4	5	7	8	10	11	12	14	15
Induction Icing Thresholds: Critical for engine start: Temp $\leq +47^{\circ}\text{F}$ with RH $\geq 50\%$ and visible moisture present. Visible moisture includes fog (vsby $\leq 1\text{NM}$), rain, wet snow, etc.									
Icing: Icing will degrade mission					Turbulence: May operate in LGT/MDT, but will try to avoid all turbulence				
Lightning/TSTMS: Avoid by 10NM below FL230 and 20NM above FL230					In-Flight Refueling: FL110 to FL300, vsby $\geq 1\text{NM}$				
Radar: Weather radar installed									
Remarks:									

Attachment 9

EXERPTS FROM 25 OWS BACK-UP PLAN

A9.1. Purpose. This Plan guides 25 OWS operations to help alleviate loss of 25 OWS mission capability (MICAP) during communications/equipment outages.

A9.2. Limitations of this Back-up Plan. The 25 OWS is under-equipped to provide back-up support fully in accordance with AFMAN 15-129, Chapter 9, *Back-up Procedures*. This plan provides a strawman for back-up support that is currently technically feasible but does not fully compensate for the loss of MICAP nor offer long-term solutions. Additionally, the 25 OWS has no suitable alternate site to deploy to in the event of an evacuation of its facility. The 25 OWS requires MAJCOM assistance to find an equipped, alternate site suitable enough to establish long-term back-up weather operations.

A9.3. 25 OWS Lead Points of Contact (POCs). The lead meteorologist or highest ranking person on duty in the CONUS and USSOUTHCOM operations flights will serve as Lead POCs for their respective areas of responsibility (AORs) during outages. The Lead POCs direct appropriate implementation of the back-up support SOP. The two Lead POCs will coordinate their actions to eliminate duplication of effort and increase efficiency. If a conflict occurs during the coordination process, the CONUS Lead POC will make the determination on how to proceed. If either Lead POC requires assistance, they should contact the 25 OWS/DO, 25 OWS/WXA, or 25 OWS/CC for guidance.

A9.4. Range of Scenarios. Every communications/equipment outage is unique. The 25 OWS' first priority is assessment of MICAP loss and implementation of troubleshooting procedures. The next step is to notify supported units and initiate back-up support procedures in accordance with this plan. However, some outages will require full implementation of this plan while others might only require partial implementation. Should an outage only affect a limited number of supported units, the Lead POCs will ensure contact only with affected units. Additionally, the nature of the outage may require using additional SOPs. If in doubt about how to proceed, the Lead POCs should contact the 25 OWS/DO, 25 OWS/WXA, or 25 OWS/CC for clarification.

A9.5. Notification of Supported Units. If an outage is anticipated to last up to the time when the next 25 OWS weather input is due to a supported unit, the Lead POCs must determine a MICAP, which supported units are affected, and initiate notification with affected units. All contacts with supported units must be annotated in *The 25 OWS Communications/Equipment Outage Notification Log* located in the Outage Log Binder at the Lead Synoptician position. The REMARKS section must show the exchange of information with the supported unit (if multiple units are given the same information, use of " is acceptable). **Note: It is very important that the notification log contain the contacted unit's POC initials or name and date/time group of contact.** Additionally, when possible, the Lead POCs will post an outage and loss of MICAP message with contact information on the 25 OWS website. Notification and support prioritization is based upon tiers identified in AFMAN 15-129, paragraph 9.2.

A9.5.1. Tier 1a. Operation NOBLE EAGLE. When Operation NOBLE EAGLE support is affected, the CONUS Lead POC must notify the Weather POC at the 26 OWS, MSgt Benson, DSN 781-0209. The Lead POC will hand-off weather support responsibility to the 26 OWS during the outage. If the Weather POC is unreachable, contact the 26 OWS 24-hour number at DSN 781-4775, and request assistance.

A9.5.2. **Tier 1a. Other Wartime, Contingencies, and Military Operations Other Than War (MOOTW).** In the event 25 OWS weather support for wartime missions, contingencies, and MOOTW is affected, the CONUS and USSOUTHCOM Lead POCs must notify the appropriate supported unit POCs. When technologically feasible, Lead POCs will make alternative arrangements for the weather support or advise the supported units on where to obtain interim weather support. **Note: The 25 OWS is under-equipped to provide back-up weather support to units not collocated with a CWT. As a minimum, Lead POCs will refer supported units to JAAWIN (<https://afweather.afwa.af.mil>) and Secure JAAWIN (SJAAWIN, <http://safwin.offutt.af.smil.mil/>) websites at AFWA.**

A9.5.3. **Tier 1a. and b. Units Collocated with a CWT.** Lead POCs will ensure contact with all supported units via telephone. Lead POCs will hand off Terminal Aerodrome Forecast (TAF) and weather watch, warning, and advisory (WWA) responsibilities to supported CWTs. However, the 25 OWS forecasters must maintain close contact with supported units via telephone when weather information is available to aid in TAF/METWATCH and WWA support. **Note: This is not a long-term solution for back-up support to CWTs. CWTs are reengineered and do not have the manning/resources to sustain their support for extended periods of time.**